

Problem 2 (15 points)

Given the state table below, determine if it is minimal.

PS	Input			
	$x=a$	$x=b$	$x=c$	$x=d$
✓ A	G, 1	E, 0	G, 1	C, 0
✗ B	D, 0	G, 0	E, 0	F, 1
✓ C	E, 1	G, 0	F, 1	A, 0
✓ D	E, 1	G, 0	F, 1	C, 0
✗ E	C, 0	G, 0	E, 0	F, 1
○ F	C, 1	B, 1	A, 0	B, 1
✗ G	C, 0	E, 0	G, 0	F, 1
✓ H	G, 1	E, 0	F, 1	A, 0

NS, z

If not, show the minimal FSM

$$P_1 = (A, C, D, H)(B, E, G)(F)$$

	A	C	D	H	B	E	G	F
a	2	2	2	2	1	1	1	
b	2	2	2	2	2	2	2	
c	2	3	3	3	2	2	2	
d	1	1	1	1	3	3	3	

$$P_2 = (A)(C, D, H)(B, E, G)(F)$$

	A	C	D	H	B	E	G	F
a	3	3	3	3	2	2	2	
b	3	3	3	3	3	3	3	
c	3	4	4	4	3	3	3	
d	2	1	2	1	4	4	4	

$$P_3 = (A)(C, H)(D)(B, E, G)(F)$$

	1 A	2 C	3 H	4 D	5 B	5 E	5 G	5 F
a		4	4		3	2	2	
b		4	4		4	4	4	
c		5	5		4	4	4	
d		1	1		5	5	5	

	1 A	2 C	3 H	4 D	5 B	5 E	5 G	6 F
a		5	5			2	2	
b		5	5			5	5	
c		6	6			5	5	
d		1	1			6	6	

$$P_5 = P_4$$

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Minimal FSM:

PS	$x=a$	$x=b$	$x=c$	$x=d$
G1	G5, 1	G5, 0	G5, 1	G2, 0
G2	G5, 1	G5, 0	G6, 1	G1, 0
G3	G5, 1	G5, 0	G6, 1	G2, 0
G4	G3, 0	G5, 0	G5, 0	G6, 1
G5	G2, 0	G5, 0	G5, 0	G6, 1
G6	G2, 1	G4, 1	G1, 0	G4, 1

NS, z

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